visible in these longitudes; the declinations are omitted from the maps, but this information, and the right ascensions of every star marked, are given in the table showing the mean places (and annual change) for January, 1904. Other lists include the names of the constellations and the principal stars in each, and a complete alphabetical list of stars in the maps.

With regard to the general get-up of the maps, letterpress, and portfolio which encloses them, more could not be desired, and great credit is due to both compiler and publisher for producing such a serviceable and handsome set of star charts for the use of beginners, and at such a low price. W. J. S. L.

A CONTRIBUTION TO MUSEUM HISTORY.

The History of the Collections contained in the Natural History Departments of the British Museum. Vol. i. Pp. xvii+442. (London: Printed by Order of the Trustees of the British Museum, 1904.)

EVERY museum of the first rank has two histories, one of which is usually written but rarely published—the history of the gradual accumulation of the museum material, by purchase, exchange, or donation, and another, which can hardly ever be written—the history of the internal metabolism, the arrangement and re-arrangement, the differentiation and integration, the "Kampf der Theile im Organismus." It may not be difficult to indicate how various museums have adapted themselves to the advance of science and to their growing constituency under the influence of effective directors, how nature has crept in between the teeth of the abstractive scientific fork, how evolutionary series have replaced static taxonomic displays, how problems of practical human interest have been recognised, how a mere chamber of horrors has become an introduction to a rational study of pathological variation, and so on; but who can ever tell the detailed physiological story of the metamorphoses? For the great museum is an organism of many parts, each with its *spiritus rector,* each developing independently, and yet in cooperation with the rest. It may not be difficult to show how a museum has changed or is changing as the various objectives—for instruction, for investigation, for inspiration—have become more clear to the organisers; when, for instance, the simple step is taken of discriminating between what can be usefully exhibited and what should be as usefully concealed; but who can ever tell how much even this simple step costs? Is the priceless connecting link to be shown with blinds up or with blinds down, or not at all? But we must not intrude further into the real history of a great museum; it is an intricate story of thrust and parry between keepers and their environment, both animate and inanimate. The history before us is a history, not of the British Museum (Natural History Departments) as a growing organism; it is the history of the collections—a story of accretion.

The first volume of the history of the collections preserved in the four natural history departments of the British Museum deals with the botanical, geological, and mineralogical material, and also with the libraries. It has been produced at the suggestion of the director, Prof. E. Ray Lankester, by the officers in charge of the collections. Mr. B. B. Woodward has written the history of the libraries; Mr. George Murray, assisted by Mr. Britten, that of the department of botany; Dr. Arthur Smith Woodward, with valuable help from the late keeper, Dr. Henry Woodward, and from Dr. Bather, assistant keeper, that of the department of geology; and Mr. Fletcher that of the department of minerals. The second volume will deal with the department of zoology.

It need hardly be said that the various histories of the collections are scholarly productions; they tell of the foundation-stones and of the additions made from year to year, and they give an annotated alphabetical list of the numerous benefactors and vendors. The result is not adapted for fireside perusal, but it is very impressive, giving us a correct idea of the variety, extent, and importance of the immense series of collected specimens which are carefully guarded and ordered, "not only" (according to the terms of Sir Hans Sloane's will) "for the inspection and entertainment of the learned and curious, but for the general use and benefit of the public to all posterity." And it is also interesting to turn over the leaves and observe how many famous names occur on the honourable lists. Many of the short biographical notes in the geological and mineralogical sections supply valuable historical material. A useful addendum, we think, would have been a series of references to the catalogues and memoirs in which the collected material has been described.

The book will be of great value to investigators who wish to trace collections and specimens, or who wish to know beforehand what to expect in the British Museum; and everyone will agree that it furnishes abundant documentary proof of the carefulness and business-like methods of the great museum, which is one of the national assets that we have most reason to be proud of.

SCIENCE AND METAPHYSICS.

Scientific Fact and Metaphysical Reality. By Robert Brandon Arnold. Pp. xxiii+360. (London: Macmillan and Co., Ltd., 1904.) Price 10s. net.

IF this book does not conform to the adage "*Nonum prematur in annum*"—for Mr. Arnold's undergraduate career is no distant memory—that is no ground for complaint. The work is not only one of great promise, but a notable performance. In originality of conception, vigour and clearness of statement, width of outlook and fairness to all the aspects of experience, it would be with difficulty surpassed. At the same time it is quite unpretentious; there is no parade of learning; there is not a single foot-note. The one digression of any length—on

modern militarism—is as interesting as it is pardonable.

The following are some of the main characteristics of the author's point of view:—(1) While defending metaphysics from the charge of being "built upon air or quicksands," he readily admits that it has not always taken full advantage of the science which it knows, and that greater accuracy of scientific detail ought to be displayed if it is to appeal to the "plain man" with some knowledge of physics, chemistry, and biology. In the same spirit the chapters on God and the Absolute and Human Immortality attempt to do something like justice to the religious aspirations of the "plain man," which are so severely neglected in such a work as "Appearance and Reality." (2) Mr. Arnold prefers *activity* to *existence* as a basis for investigation. The lower animals, in his view, display only "teleological activities"; the entity "mind" (self-conscious and introspective) belongs only to men. And perhaps not even to all men: "a human being might theoretically pass through life and never be actual mind; possibly with some savages this is almost the truth." (3) Again, Mr. Arnold is fond of the contrast between the individuation (real and objective in every sense) by means of the atom or the electron—"the true physical entities"—and the individuation by means of colour, sound, and the like which depends on our "particular sensuous evolution." The latter form of individuation, which finds expression particularly in the "material totalised image," seems therefore to show that in mind (including "teleological activity") there is something new in principle. "But by asking whether it is a new entity we merely confuse matters. For we should thus assume that the physical world is once and for all limited to atomic activities, whereas all observations tend to show that the various entities are continually changing and re-organising themselves, and developing new relations and qualities." In one sense Mr. Arnold claims that his view of mind in the non-introspective animal is as materialistic as it could be, since mind under such conditions "is matter totalised in a special manner in relation to an external crisis." But he hastens to add that "pre-mental matter was not merely the matter of physics and chemistry." And mind in man he certainly regards as something very different.

It is impossible to do justice to this suggestive work in a short notice, and we are well aware that the above is only a hasty and somewhat arbitrary selection of a few of the topics treated. The views of matter and ether, in particular, might well have a notice of their own; so might the chapter on psycho-physical interaction, which is almost a model of philosophical discussion. In this last the theory is stated that the initial impulse required to liberate the energy of the muscular system comes ultimately from "external sources," *e.g.* when the sight of some object moves us to pursue it, from the ethereal vibrations which we apprehend as light. But for the author's defence (in many ways successful) against the obvious objections to this view, we must refer to the book itself.

OUR BOOK SHELF.

Index of Spectra. (Appendix O.) By W. Marshall Watts, D.Sc. (Lond). Pp. 40. (Manchester: Abel Heywood and Son, 1904.) Price 3*s*.

THIS is the latest addition to the very useful series of appendices which Dr. Marshall Watts has given to his well-known "Index of Spectra." In it he has brought together the arc spectrum of molybdenum by Hasselberg, the spark spectra of calcium, scandium, indium, beryllium, lithium, thallium, antimony, and arsenic, by Exner and Haschek; of calcium, lithium, thallium, and antimony, by Eder and Valenta; of radium, by Runge and Precht; and the oxy-hydrogen flame spectra of lithium, potassium, rubidium, and cæsium, by Ramage. Hasselberg's comprehensive record of the arc lines of molybdenum takes up about half the pages of the appendix. In the cases of metals investigated both by Exner and Haschek, and Eder and Valenta, the records are compared in parallel columns. The oscillation frequencies corresponding to the wave-lengths of all the lines given have been reduced by the compiler.

La Matière, l'Éther et les Forces physiques. By Lucien Mottez. Pp. 236. (Paris: Gauthier Villars, 1904.) Price 4 francs.

THE time is fast coming when the qualification which will play the most important part in determining a man's reputation as a physicist will be that he shall abstain from writing books on the philosophy of ether, matter, and the universe. The present book discourses pleasantly about gravitation, heat, electricity and magnetism, polarisation of light, chemical action, and such like matters. It is hardly the kind of book to which a beginner would turn to get his first lessons on physics, as the style is too discursive, and it contains little but what an average physicist either knows or has probably thought of already; and yet we can only say about books of this kind, "still they come." Who reads them?

The Uses and Wonders of Plant-hairs. By Kate E. Styan. Pp. iv+65; with plates. (London: Bemrose and Sons, Ltd.) Price 1*s*.

THE nature and purpose of plant-hairs will have occurred to many teachers as a favourable subject for a course of nature-study. The presence or absence of hairs in allied plants, even in the same plant when growing under different conditions, their position and form, their mechanism and use, afford plenty of opportunity for consideration and deduction. The book offers a fair *résumé* of facts, but it is not obvious that the writer is recording personal observations, and the appendix of illustrations loses some of its value as no allusion is made to it in the text.

LETTER TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Planet Fortuna.

ALTHOUGH NATURE is scarcely the proper place for a disquisition on a Latin quotation, perhaps you will admit of a further correction of "W. T.'s" correction (p. 461) of the lines quoted by "W. E. P." Numen is, I believe, never used except in the sense of *good* luck, being derived from nuo, and signifying the nodding approval of the gods; hence "Nullum numen habes, si sit prudentia," would mean just the opposite to the obvious sense of the passage. The best editions give, in both the satires where the line occurs, "Nullum numen abest," and this makes sense. Except for this word, "W. T.'s" version is correct.

SPENCER PICKERING.